DOCUMENT RESUME

ED 194 205 PS 011 802

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TITLE A Comparison of Half-Day and Full-Day Kindergarten Classes on Academic Achievement.
INSTITUTION Maryland State Dept. of Education, Baltimore.
PUB DATE 6 Nov 80
NOTE 13p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; Comparative Analysis; *Influences; *Kindergarten Children; Primary Education; *Program Length
IDENTIFIERS Maryland; Metropolitan Achievement Tests

ABSTRACT

This study was designed to measure how the length of the school day affects the academic achievement of kindergarten children. A total of 189 kindergarten children were divided into two groups. The study group consisted of 131 children from five classes who attended class for a full school day, and the control group consisted of 58 children from three classrooms who attended class for the regular half-day program. Results indicated that the full-day program kindergarten children achieved significantly higher levels of academic skills than the half-day program children, as measured by the Survey Battery of the Metropolitan Achievement Tests (1978). The results were discussed in terms of the relationship between length of school day and academic achievement. (Author/MP)

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A COMPARISON OF HALF-DAY AND FULL-DAY KINDERGARTEN CLASSES ON ACADEMIC ACHIEVEMENT

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November 6, 1980

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PS011802

ARTICLE

A Comparison of Half-day and Full-day Kindergarten Classes on Academic Achievement

Abstract:

This study was designed to measure how the length of the school day affects the academic achievement of kindergarten children. A total of 189 kindergarten children were divided into two groups. The study group consisted of 131 children from five classes who attended class for a full school day, and the control group consisted of 58 children from three classrooms who attended class for the regular half-day program. Results indicated that the full-day program kindergarten children achieved significantly higher academic skills levels than the half-day program children, as measured by the Survey Battery of the Metropolitan Achievement Tests (1978). The results were discussed in terms of the relationship between length of school day and academic achievement.

INTRODUCTION

A review of early childhood programs both nationally and in Maryland, indicate that prekindergarten and full-day kindergarten programs are becoming as much a part of the total educational system as any other grade or level. However, definitive data is limited on the value of full-day, five-year-old kindergarten programs because there is not yet adequate information to analyze precisely the relationship of programs and scheduling to academic achievement.

The expansion of half-day kindergarten programs into full-day programs for young children has been of paramount interest to early childhood educators during the last several years. The tenets of many developmental psychologists and educators, such as Benjamin Bloom (1964), Hunt (1969), and Piaget (1974), suggest that as much as 50% of mature intelligence is developed by age four and 80% by age eight. This suggests that the first six years of life are the most critical for learning. A kindergarten experience is part of this "critical" phase of children's development.

Jane E. Mueller, in a paper presented at the annual meeting of the American Research Association (1977) on Effects of Entry-Level and Pattern of Title I, compared Title I and non-Title I third grade measures of achievement on two kindergarten groups. Full-day and half-day kindergarten programs were compared. On the one-year treatment, full-day kindergarten had the greatest possible effect on achievement. Similarly, in a study by Lysiak and Evans, Kindergarten--Fun and Games or Readiness for First Grade: A Comparison of Seven Kindergarten Curricula (1976), full-day programs for low socioeconomic children were signficantly more effective than half-day kindergarten programs.

Ronald H. Nieman (1975) presented a paper at the meeting of the American Educational Research Association providing evidence that a positive

relationship existed between second grade test scores and the amount of time a child experienced in prekindergarten and kindergarten programs. This positive relationship existed independent of a wide range of teaching styles, materials, and methodologies.

In a 1979 presentation to the American Education Research Association, Loveridge and Carapella cite evidence of the positive impact of their Title I Kindergarten Extended Day Program. Their investigation compared similar groups of children who attended half-day vs. full day kindergarten programs. Preliminary analysis of their data revealed larger pre- to posttest gains on measures of the Basic Skills inventory for the Kindergarten Extended Day group. Furthermore, when differences in group selection were statistically controlled, the students who participated in the extended day program demonstrated higher scores on the Mathematics and Visual and Auditory Discrimination subtests of the California Test of Basic Skills.

Other studies indicate that the extended kindergarten experiences have a positive effect on variables other than academic achievement. For example, Beckner, Tamyra L., et al., (1978) A Study of the Relationship of Kindergarten Class Size, Length and Scheduling of the Kindergarten Day, and Teacher Self-Concept to School Success showed that teachers who worked with half-day programs experienced more frustration in trying to provide for all the needs and interests of two different sets of children. In this instance, teacher self-concept regarding full-day kindergarten programs appeared to be an important variable that affected student school achievement.

In the political/theoretical arenas, supporters of full-day kindergarten programs argue that contrary to previous beliefs, teachers and parents desire longer sessions for kindergarten pupils, and the children benefit from such experiences. These supporters contend that changing family patterns and the

nature of the educational opportunities for young children require a full day schedule for kindergarten children.

This study was designed to determine the academic effects of the length of school day on five-year-old kindergarten children in selected schools in Maryland. This question demands immediate research attention in light of the controversies surrounding the issue. Considering what data is available, it was predicted that lengthening the school day for kindergarten children would have significant benefits in the areas of mathematics, reading, and language skills over that of similar age children attending a regular half-day kindergarten program.

METHOD

Sample

One hundred eighty-nine urban and rural kindergarten children in five local education agencies (LEAs) in Maryland participated in this study. The fifty-eight control group children attended either an afternoon or morning half-day session. The experimental group consisted of one hundred thirty-one children who attended full-day school kindergarten programs in five different classrooms in five different local education agencies.

In all cases, there was no identified systematic procedure for selecting children for either full or half-day kindergarten sessions. This "random" procedure also applied to the four classes where both half and full-day sessions were operating in the same school attendance zone. Children in both the control and experimental groups, by-and-large, represent the normal selection and assignment of children to classes which regularly occurred in the school's procedure.

The teacher selection for the kindergarten classes was strictly

administrative and controlled by the needs of the school (i.e., in all five experimental and one of the two control schools there was only one kindergarten class). Full-day kindergarten programs were assigned to schools based on the submission of grant awards to local education agencies that were awarded state funds for the kindergarten pilot project.

Treatment

The educational program for each kindergarten classroom was determined by its particular local education agency. The sample population did not receive any type of treatment for the purposes of the study than was being utilized by those kindergarten children who did not participate. Children who attended full-day kindergarten programs were given instruction with an extended schedule of six hours, while kindergarten children who attended half-day sessions were exposed to traditional half-day kindergarten schedule of two and one-half hours. For the purposes of this investigation, the independent variable was the length of the school day and the dependent variable was academic achievement.

Procedure and Instrumentation

The Survey Battery of the Metropolitan Achievement Tests (1978) was administered to kindergarten children in the sample by their teachers at the beginning (fall, 1978) and at the end (spring, 1979) of the school year. All teachers were trained by the experimenter in the administration of the survey instrument. The children were tested in small groups of ten or less according to the directions in the administration manual. No child was administered more than two test sessions per school day.

All children during the pretest phase were administered the Preprimer (Form JS) level of the test. The appropriate level test for the posttesting, either Preprimer (JS) or Primer (JS) was selected for each child based on a combination of pretest score and teacher judgment. There was no evidence of "floor or ceiling" effects observed in the data indicating appropriate level

selection took place.

Both levels of the Basic Survey battery used in this investigation are part of a larger coordinated range of tests which yield one score in each of the curricular areas of reading, mathematics, and language, as well as a total basic battery score. The reading subtest at the preprimer level focuses on such skills as visual discrimination of letters and at the primer level word reading is emphasized. At both the preprimer and primer levels the mathematics subtest measures numeration, measurement, and problem solving, whereas the language subtest emphasizes listening comprehension.

Sample attrition in the experimental and control samples occurred as a result of missing one or more of the posttesting sessions due to a variety of reasons not controlled or due to this investigation or program characteristics (i.e., sickness, moved away, etc.). There was no exclusion of any child's test scores from this study if he was present for any of the posttesting session.

RESULTS AND DISCUSSION

The data was analyzed for each subtest area (i.e., math, reading, and language skills) and the total composite test score was derived from the standard scores reported by the test manufacturer. The analysis of covariance was utilized for analyzing each subtest of the spring posttest scores using the test's pretest score as the covariate. This analysis is consistent with the central hypothesis, which concerns differences in obtained academic skills between the half-and full-day kindergarten groups while accounting for the children's (possible) differing entering level in the particular areas tested.

A significant main effect for academic learning was obtained between the independent variables (i.e., half and full school day) for each area

tested. The adjusted F values with the appropriate covariate and residual scores for each tested dependent variable (i.e., reading, math, language, and total test) are summarized in Table 1.

Table 2 summarizes the adjusted mean standard scores for each group, the corresponding normal curve equivalent score (NCE's), and grade equivalent scores (G.E.'s) for each group for each analysis. There does not exist a perfect correlation between the derived scores and the statistically accurate scores provided by the standard and NCE scores. In terms of the GE's, an "on grade level" performance could be considered with a range of K.6 to 1.1. Regardless of the type of score reported in Table 2, the results are the same: The full-day kindergarten group scores higher than the half day control group to a statistically significant degree ($p < .001$) in every considered category.

The results of the present study demonstrate that children who attend a full school day kindergarten program achieve higher academic skills in math, reading, and language than do their peers who attend a regular half day session. While the results reported in Table 2 indicate that the half day program group can be considered within the lower range of expected performance with no special invervention, the full day group scores show that they are already performing at first grade level in every tested area. The evidence clearly supports the argument that kindergarten children exposed to an extended schedule, such as a full-day program, signficantly improve in academic achievement as compared to a shorter day program.

CONCLUSIONS

It has been demonstrated that achievement gains before first grade have long term impact and inhibit special education placement in later school grades. In line with these results, it appears that extending the schedule

for kindergarten children would be beneficial for two reasons. First, kindergarten children are provided additional time for mastering skills, which will enhance their chances of achievement in later elementary grades. Secondly, by increasing achievement before first grade, the potential number of children for grade retention and special education placement is reduced. Ultimately, a preventive educational method in the early years is a monetary saving compared to the costly process of educational remediation.

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Table I

Analysis of Covariance for Metropolitan Achievement Test
Comparing Half vs. Full-Day School Program

Source	Sum of Squares	Degrees* of Freedom	Mean Square	F**
Adjusted Main Effect, Reading	180165.	1	180165.	49.04
Covariate, Pretest Reading	1228293.	1	1228293.	343.33
Residual	543731.	148	3673.	
Adjusted Main Effect, Math	92116.	1	92116.	26.19
Covariate, Pretest Math	547501.	1	547501.	155.66
Residual	517047.	147	3517.	
Adjusted Main Effect, Language	43334.	1	43334.	12.02
Covariate Pretest Language	624443.	1	624443.	173.25
Residual	547860.	152	3604.	
Adjusted Main Effect, Total	63022.	1	63022.	55.98
Covariate Pretest Total	505754.	1	505754.	449.27
Residual	158727.	141	1125.	

*The differences in degress of freedom for each procedure was due to children missing a particular test administration which was done over a period of days.

**All F values significant at $p \leq .001$.

Table II

Adjust Means for Standard Scores on
Metropolitan Achievement Test, and
Corresponding Normal Curve Equivalent Scores (NCE's)

Area Tested	Experimental Group	N*	Adjusted Standard Score	Corresponding NCE	Grade** Equivalents
Reading	Study	100	402.7	61.0	1.1
	Control	51	329.2	40.1	K.7
Math	Experimental	100	353.7	57.5	1.2
	Control	50	300.9	42.5	K.4
Language	Experimental	100	311.9	57.5	1.0
	Control	55	276.9	48.9	K.6
Total	Experimental	100	336.2	61.0	1.1
	Control	44	290.7	41.3	K.6

*Differences in N are due to children missing the administration of the various subtests which were administered over several days.

**All differences are significant as reported in Table I.